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NOTE ON THE PRECEDING PAPER.

By F. Morley.

The interesting theorem of Section 6 in the preceding paper, that the Fermat or equiangular points of the 4 triangles formed from 4 concyclic points are arranged on circles, suggests the following treatment.

To obtain a convenient curve for handling metrically four points of a plane, a_1, a_2, a_3, a_4, we may look for points x such that the joins xa_i are apolar with the isotropic lines on x, taken twice. Analytically, if t_i be the clinant of xa_i, we are to have

$$s_2 = \Sigma\, t_1 t_2 = 0.$$

The locus of x is of the fourth order on the points a_i, with double points at the absolute points. Hence it is an elliptic quartic.

For an equiangular point, say e_4 of a_1, a_2, a_3, we have

$$t_1 + t_2 + t_3 = 0 = t_2 t_3 + t_3 t_1 + t_1 t_2,$$

so that

$$s_2 = 0.$$

That is, any four points and their eight equiangular points, are on a bicircular quartic.

Let u be an elliptic parameter on this curve. Then by Clebsch's statement of Abel's theorem, for four points on a circle

$$\begin{aligned} u_1 + u_2 + u_3 + u_4 &= \text{constant}, \\ &= 0, \text{ say}. \end{aligned}$$

Naming each point by its parameter and noting that the chord $a_1 a_2$ subtends angles of 120° at e_3 and e_4, and therefore e_3, e_4, a_1, a_2, are on a circle, we have

$$a_1 + a_2 + e_3 + e_4 = 0$$

and similarly

$$a_3 + a_4 + e_1 + e_2 = 0.$$

If then the points a_i are on a circle,

$$a_1 + a_2 + a_3 + a_4 = 0,$$

so that

$$e_1 + e_2 + e_3 + e_4 = 0,$$

that is, the four equiangular points are on a circle.

In this way we have a configuration of circles arising from four concyclic points which is deserving of study.